

An Outbreak of the Severe Acute Respiratory Syndrome: Predictors of Health Behaviors and Effect of Community Prevention Measures in Hong Kong, China

Catherine S. K. Tang, PhD, and Chi-yan Wong, MSSc

The current global outbreak of the severe acute respiratory syndrome (SARS) poses an international public health threat.¹ Hong Kong, China, remains one of the most severely affected areas. We aimed to identify psychosocial factors associated with SARS preventive health behaviors and to assess whether preventive health behaviors increased after launching SARS community prevention activities.

METHODS

We telephone interviewed 1002 adult Chinese in wave 1 (March 17–18, 2003), which represented the early stage of the SARS outbreak in Hong Kong. A separate sample of 1329 adult Chinese were also telephone interviewed in wave 2 (March 29–April 1, 2003), which represented a period of vigorous communitywide SARS prevention activities by local health authorities. Response rates of the participants, calculated as percentages of completes to completes plus refusals, were 53% and 65% for waves 1 and 2, respectively. These two samples were comparable in various demographic information. The overall age distribution was 20% for 18 to 29 years, 50% for 30 to 49 years, 15% for 50 to 59 years, and 15% for 60 years or older.

We used key concepts of psychosocial models of health behaviors^{2–4} to design our

survey, which included the following measures.

Practice of Preventive Health Behaviors

Local health authorities have recommended the following preventive health behaviors to prevent the contracting and spreading of SARS: maintaining good personal hygiene, developing a healthy lifestyle, ensuring good ventilation, and wearing face masks. We asked participants in wave 1 to indicate how often in the past week they had practiced at least 1 of the above preventive health behaviors. In wave 2, we specifically asked participants how often they wore face masks to prevent contracting SARS during the last week. Participants responded with (1) never, (2) only a few times, (3) sometimes, or (4) almost all the time. We classified the first 3 responses as inconsistent preventive health behaviors (coded as 0) and “almost all the time” as consistent preventive health behaviors (coded as 1).

Perceived Knowledge About SARS, Susceptibility to SARS, and Self-Efficacy in Performing the Suggested Preventive Health Behaviors

These 3 psychosocial factors were each measured by 1 item. Participants indicated their perceptions on 4-point scales, with high scores representing high levels of these factors.

Attitudes Toward SARS Prevention Measures

Participants in wave 2 were assessed on their attitudes toward SARS community prevention measures by 5 items (on 4-point scales): (1) whether enough information was provided, (2) whether health guidelines were clear, (3) whether they believed that the suggested preventive health behaviors were effective, (4) whether they were satisfied with the government, and (5) whether they had confidence in the government's ability to control the spread of SARS. High scores corresponded to very favorable attitudes. The α value for this scale was .73.

Demographics

All participants were asked about their age, education, income, and employment status.

RESULTS

We used SPSS 10.0 (SPSS Inc, Chicago, Ill) statistical software to conduct data analyses. The rates of preventive health behaviors for waves 1 and 2 are presented in Table 1. Results of a logistic regression analysis indicated that higher rates of preventive health behaviors in wave 1 (before exposure to SARS community prevention measures) were significantly related to greater perceived susceptibility to contracting SARS (odds ratio [OR]=1.468; 95% confidence interval [CI]=1.089, 1.979), greater self-efficacy in performing the preventive health behaviors (OR=2.304; 95% CI=1.672, 3.175), and older age (OR=1.125; 95% CI=1.063, 1.190).

The practice of SARS-specific preventive health behaviors (wearing of face masks) in wave 2 was expressed as a function of preventive health behaviors before exposure to SARS community prevention measures and attitudes toward these measures. The probability of preexposure preventive health behaviors was calculated from estimated coefficients of various psychosocial and demographic factors as derived from wave 1. Results of the logistic regression analysis indicated that higher rates of preventive health behaviors in wave 2 were associated with more favorable attitudes toward prevention measures (OR=1.493; 95% CI=1.097, 2.033) and higher probability of preexposure preventive health behaviors (OR=2.662; 95% CI=2.154, 3.289; Table 2). The marginal effect of favorable attitudes toward prevention measures was estimated to be a 9.2% increase in preventive health behaviors in wave 2 with 1-unit change in these attitudes (measured on 4-point scale). In waves 1 and 2, 32.7% and 61.2%, respectively, of the participants reported consistent practice of preventive health behaviors (OR=3.245; 95% CI=2.735, 3.852; power=1.00).

DISCUSSION

Our results were supportive of the contribution of perceived susceptibility,² self-efficacy,⁴ and age^{5–7} in predicting the practice of preventive health behaviors. Favorable attitudes toward SARS prevention measures also were associated with higher rates of SARS-specific

TABLE 1—Rates of Preventive Health Behaviors

	Wave 1: No. Practicing Preventive Health Behaviors/Total (%)	Wave 2: No. Wearing Face Mask/Total (%)
Sex		
Male	136/449 (30.3)	281/533 (52.7)
Female	190/549 (34.6)	531/794 (66.9)
Age, y		
19–29	52/225 (23.1)	142/269 (52.8)
30–49	177/513 (34.5)	383/620 (61.8)
50–59	42/137 (30.7)	133/195 (68.2)
> 60	49/109 (45.0)	154/243 (63.4)
Education		
Primary school	48/145 (33.1)	169/280 (60.4)
High school	188/610 (30.8)	434/717 (60.5)
Community college/university	88/235 (37.4)	198/311 (63.7)
Employment		
Full-time/part-time	177/552 (32.1)	426/701 (60.8)
Homemakers	63/180 (35.0)	190/277 (68.6)
Students	26/95 (27.4)	47/103 (45.6)
Retired	39/89 (43.8)	105/164 (64.0)
Unemployed	19/70 (27.1)	35/68 (51.5)
Personal monthly income, \$		
< 1000	16/69 (23.2)	42/91 (46.2)
1000–2500	96/281 (34.2)	229/377 (60.7)
2501–5000	37/108 (34.3)	75/127 (59.1)
> 5000	8/22 (36.4)	28/41 (68.3)
Overall	327/1002 (32.6)	812/1329 (61.2)

preventive health behaviors. Furthermore, we supported that community-level prevention measures against SARS were related to significant increases (28.5%) in individuals' practice of the recommended preventive health behaviors. We suggest that SARS community prevention activities should focus on the perception of personal vulnerability as well as the promotion of self-efficacy and favorable attitudes toward prevention measures. Finally, it should be noted that increases in the suggested preventive health behaviors might have been influenced by other extraneous factors in addition to being exposed to SARS community prevention measures. ■

About the Authors

Catherine S.K. Tang and Chi-yan Wong are with the Chinese University of Hong Kong, Shatin, NT, Hong Kong, China.

Requests for reprints should be sent to Catherine S.K. Tang, PhD, Department of Psychology, The Chinese University of Hong Kong, Shatin, NT, Hong Kong, China (e-mail: ctang@cuhk.edu.hk).

This brief was accepted June 5, 2003.

Contributors

Both authors contributed to the conception and design of the study, data analysis, and interpretation of findings. C.S.K. Tang took the lead in writing the brief.

Human Participant Protection

No protocol approval was needed for this study.

TABLE 2—Logistic Regression Results on Preventive Health Behaviors

	Coefficient	SE	OR	95% CI	P
Wave 1: Before exposure to prevention measures					
Constant	-5.463
Knowledge	0.165	0.128	1.179	0.918, 1.514	.197
Perceived susceptibility	0.384	0.152	1.468	1.089, 1.979	.012
Self-efficacy	0.835	0.164	2.304	1.672, 3.175	.000
Sex (male)	0.200	0.152	1.221	0.906, 1.646	.189
Age	0.117	0.029	1.125	1.063, 1.190	.000
Education	0.118	0.081	1.125	0.960, 1.319	.147
Wave 2: After exposure to prevention measures					
Constant	-0.671
Estimated preexposure preventive health behaviors	0.979	0.108	2.662	2.154, 3.289	.000
Attitudes toward prevention measures	0.401	0.157	1.493	1.097, 2.033	.011

Note. OR = odds ratio; CI = confidence interval. Wave 1: number of observations = 1002; log likelihood = 1094.19; $\chi^2 = 55.41$ ($P = .000$). Wave 2: number of observations = 1329; log likelihood = 1501.84; $\chi^2 = 96.41$ ($P = .000$).

References

1. World Health Organization. Update 27: One month into the global SARS outbreak: status of the outbreak and lessons for the immediate future. Available at: http://www.who.int/csr/sars/archive/2003_04_11/en. Accessed April 11, 2003.
2. Rosenstock IM, Strecher VJ, Becker MH. Social learning theory and the health belief model. *Health Educ Q*. 1988;15:175–183.
3. Ajzen I, Fishbein M. *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice-Hall; 1980.
4. Bandura A. *Self-Efficacy: The Exercise of Control*. New York, NY: WH Freeman Co; 1997.
5. Berrigan D, Dodd K, Troiano RP, Krebs-Smith SM, Barbash RB. Patterns of health behaviors in US adults. *Prev Med*. 2003;36:615–623.
6. Pappas G. Elucidating the relationships between race, socioeconomic status, and health. *Am J Public Health*. 1994;84:892–893.
7. Shi L. Socio-demographic characteristics and individual health behaviors. *South Med J*. 1998;91: 933–941.